

Rec'd PCT/PTO 29 APR 2005

BEST AVAILABLE COPY

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/34801

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(7) : C12Q 1/68 US CL : 435/6, 91.2 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) U.S. : 435/6, 91.2  Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Medline Biosis Caplus key words: SLIT-3, MEGF5, SLIL2, diabetes, chromosome 5		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KONG et al. A high-resolution recombination map of the human genome. Nature Genetics. July 2002, Volume 31, p. 241-247.	1-3, 45
A	LINDGREN et al. Contribution of known and unknown susceptibility genes to early-onset diabetes in Scandinavia. Diabetes, May 2002, Vol. 51, No. 5, p. 1609-1617.	1-3, 45
A	FURUTA et al. Sequence of Human Hexokinase III cDNA and Assignment of the Human Hexokinase III Gene (HK3) to Chromosome Band 5q35.2 by Fluorescence in Situ Hybridization. Genomics, 1996, Vol. 36, p. 206-209.	1-3, 45
A	ITOH et al. Cloning and expressions of three mammalian homologues of Drosophila slit suggest possible roles for Slit in the formation and maintenance of the nervous system. Molecular Brain Research, 1998, Vol. 62, p. 175-186.	1-3, 45
<input type="checkbox"/> NEW ABSTRACT Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
"A"	document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"B"	earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed	
Date of the actual completion of the international search 18 August 2004 (18.08.2004)		Date of mailing of the international search report 31 AUG 2004
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 872-9306		Authorized officer Juliet Switzer <i>J. Roberts for</i> Telephone No. (571) 272-1600

Form PCT/ISA/210 (second sheet) (July 1998)

BEST AVAILABLE COPY

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/34801

**Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)**This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-3 and 45 with respect to first named species SNP at 168029068.

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

PCT/US03/34801

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING**

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

Group 1, claims 1-3 and 45, drawn to a method of diagnosing a susceptibility to type II diabetes comprising detecting a polymorphism in a SLIT-3 nucleic acid.

Group 2, claims 4-5 and 7-8, and 31-35, drawn to isolated nucleic acids, vectors, host cells.

Group 3, claim 6, drawn to a method of assaying for the presence of a nucleic acid molecule in a sample.

Group 4, claim 10, drawn to a method of assaying for the presence of a polypeptide via contact with an antibody.

Group 5, claims 11-12, drawn to a method of identifying an agent that alters SLIT-3 nucleic acid expression.

Group 6, claim 16, an agent that alters expression of a SLIT-3 nucleic acid.

Group 7, claims 19-25, a therapeutic agent.

Group 8, claim 26, drawn to a transgenic animal.

Group 9, claims 27-30, 36, 37, 38, drawn to a method of assaying for a SLIT-3 nucleic acid.

Group 10, claims 39-44 and 46-48, methods of diagnosing diabetes via haplotyping.

Group 11, claim 49-51, use of a therapeutic agent to manufacture a medicament.

Claim 9 is unsearchable because it refers to the "recombinant host cell of claim 10" but claim 10 is a method for assaying for the presence of a polypeptide.

Claims 13-15 are unsearchable because they refer to "the nucleic acid of claim 1" (as recited in independent claim 13) but claim 1 is a method claim.

Claim 17 is unsearchable because it refers to "an agent of claim 18," but claim 18 is a method of identifying a polypeptide.

Claim 18 is unsearchable because it refers to "a polymorphism indicated in table 3" but table 3 does not list polymorphisms.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Group 1, each of the polymorphisms listed in Figure 11- total of 117 polymorphisms. The first listed single nucleotide polymorphism, at position 168029068 will be searched with the main invention (Group 1). If applicant selects to pay for the search of additional species, applicant should clearly identify which polymorphisms are selected for search.

## INTERNATIONAL SEARCH REPORT

PCT/US03/34801<sup>2</sup>

Group 2, group 3, group 4, and group 9, the species are each of the 120 nucleotide sequences recited in Figure 10. If search of one of these groups is selected, please identify the selected species as well. Please give a location of the sequence in the figure as well as an appropriate SEQ ID NO for each sequence selected for search.

Group 6, the species are each of the 9 different agents listed in the claims.

Group 7, the species are each of the 22 different agents listed in the claims.

Group 10, the species are each of the 16 different haplotypes listed in tables 2 and 5.

The inventions listed as Groups 1-11 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The groups listed as groups 1-11 are not joined by a special technical feature because there is no feature that is common to all of the groups, required by the independent claim in each group. Group 1 is drawn to a method of diagnosing a susceptibility to type II diabetes, and does not recite or require specifically the nucleic acids of group 2, for example. Groups 3-11 are each drawn to products and methods which are not joined to group 1 as they have unique goals, method steps and uses. The products are not joined to one another as they are separate in chemical structure and make up, for example the products of group 2 are drawn to nucleic acids while the products of group 6 include a wide variety of molecules directed towards the alteration of expression of a nucleic acid. Thus, groups 1-11 are not joined by a special technical feature in view of the prior art.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons:

The species of group 1 are all different polymorphisms within nucleic acid sequences which are not joined by a special technical feature as they are all variations in sequences, and are different in structure, function and effect on the nucleic acid within which they are embedded. Further, the specification itself admits that many of these polymorphisms are within the prior art as it provides the "Public alias" for these polymorphisms, which is a code by which they are identified within public databases. Therefore the species of group 1 are not joined by a special technical feature.

The additional recited species are all distinct chemical molecules that are not joined by a common structure or feature. The species of groups 2-4 and 9 are all molecules having sequences that are different from one another, joined only by the fact that they are nucleic acid molecules. The species of groups 6 and 7 are all molecules which are not related in structure. The haplotypes of the species of group 10 each have unique structures and functional implications.

Thus, in this application there are 647 total groups for search, as group 1 encompasses 117 searchable groups, groups 2-4 and 9 each encompass 120 searchable groups, group 5, 8, and 11 are each single searchable groups, group 6 encompasses 9 searchable groups, group 7 encompasses 22 different searchable groups, and group 10 encompasses 16 searchable groups.